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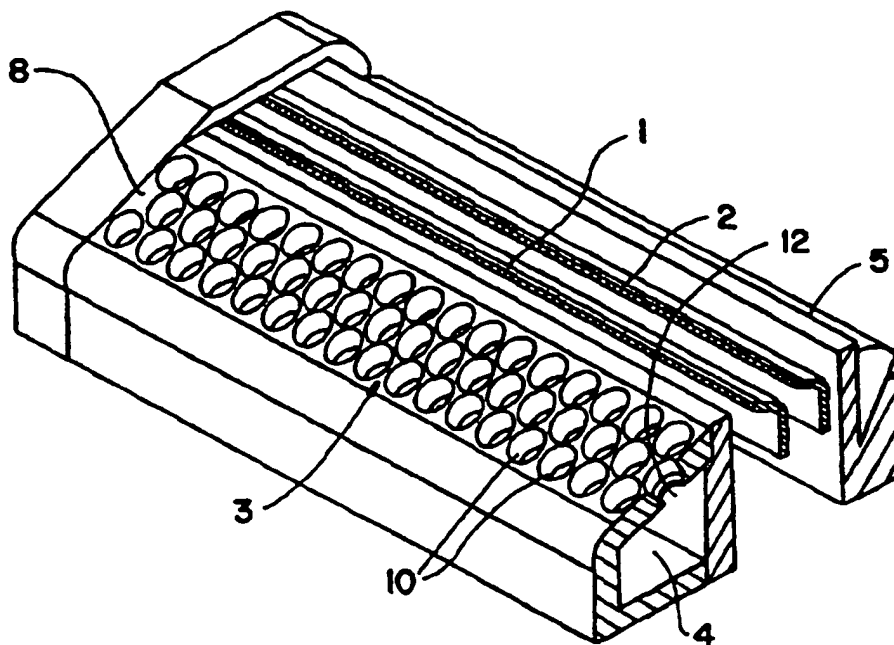
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(54) Title: SAFETY RAZORS



(57) Abstract

A safety razor blade unit (fig. 1) comprises at least one elongate blade (1, 2), and a skin engaging member (3) extends longitudinally of the blade(s) (1, 2) and defines a surface (9) exposed for contact with the skin during shaving. A multiplicity of pockets (10) are provided in the skin engaging member (3) for holding respective portions of a shaving enhancement product (fig. 2). Each of the pockets (10) opens at the skin contacting surface (9). The pockets (10) are distributed along the surface (9) and across the width thereof in an array spanning substantially the whole of the area of the skin contacting surface (9).

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- 1 -

SAFETY RAZORS

This invention relates to shaving devices and concerns a safety razor blade unit having at least one blade with a cutting edge which is moved across the surface of the skin being shaved by means of a handle to which the blade unit is attached. The blade unit may be mounted detachably on the handle to enable the blade unit to be replaced by a fresh blade unit when blade sharpness has diminished to an unsatisfactory level, or it may be attached permanently to the handle with the intention that the entire razor be discarded when the blade or blades have become dulled. Razor blade units generally include a guard which defines a surface for contacting the skin in front of the blade(s) and a cap for contacting the skin behind the blade(s), the cap and guard serving important roles in establishing the so-called "shaving geometry", i.e. the parameters which determine the blade orientation and position relative to the skin during shaving. The present invention is especially concerned with the guard and/or cap of a razor blade unit.

As a preliminary step prior to shaving it is common to apply a shaving preparation to the skin, such as shaving soap or the like to

- 2 -

facilitate the shaving operation. One effect of the shaving preparation, for example, is to lubricate the skin to enable the razor to slide more easily over the skin. In some situations, however, the skin is not prepared as well as it might be. Furthermore, at the end of shaving most of the preparation will have been removed. Therefore, it can be advantageous to provide the razor with a means for delivering a shaving enhancement composition or medium during shaving. Thus, it is known to provide a blade unit with a strip of material from which a lubricant is very gradually leached out during shaving. The benefits of such a lubricating strip have been well proven, but the active materials which can be incorporated in them is limited, e.g. by the manufacturing process, and the rate at which the lubricant is discharged is so low that an effective preparation of the skin before shaving is still needed. There have also been proposed razors which include a chamber containing a liquid shaving preparation, and a system for discharging the liquid onto the operative parts of the razor by squeezing a sponge impregnated with the liquid by applying finger pressure. However, there still remains a need for a razor adapted to dispense a shaving aid product gradually throughout the useful life of the razor blade unit, without requiring special attention by the user, such as to refill a reservoir or to cause the product to be discharged when required.

According to the present invention there is provided a safety razor blade unit having at least one elongated blade, and a skin engaging member defining a surface exposed for contact with the skin during shaving, said

- 3 -

member including a multiplicity of pockets for holding respective portions of shaving enhancement product, said pockets being distributed longitudinally and laterally over
5 the skin contacting surface and each being open at the surface.

A skin engaging member provided according to the invention may allow for the dispensing of materials which can not be
10 included in prior art lubricating strips, e.g. because they can not withstand the manufacturing process. The shaving enhancement product may be a formulation, such as semi-solid gel, which has been designed to have the desired solubilizing
15 properties, and is conveniently retained in the pockets due to the properties of the product. The product may be a viscous fluid, or a gel, and may be of a nature to be miscible with water, which is generally present during
20 shaving, or to dissolve in water, to render the product more fluid for discharge from the pockets.

In order to provide adequate supply of shaving enhancement product to last the useful
25 lifetime of the blade unit, the pockets can communicate at the inner ends with a reservoir chamber containing the shaving enhancement product to be dispensed via the pockets.

The pockets should be disposed in an
30 array with sufficient density of packing to ensure satisfactory application of product during shaving. A width of surface between the adjacent pockets of 5% to 100% of the maximum transverse dimensions of the pockets should be
35 adequate while retaining a sufficiently well defined skin contacting surface.

In a preferred construction th

- 4 -

pockets are cylindrical, i.e. have smoothly curved side walls, and conveniently the pockets are right circular cylindrical with their axes substantially perpendicular to the skin contacting surface. However, other shapes are also possible, such as hexagonal or elliptical in cross section. The depth of the pockets is less than the pocket diameter, e.g. approximately equal to the pocket radius, and the thickness of material between adjacent pockets is less than the pocket radius.

The pockets are preferably formed in a front wall of a chamber for holding a supply of a fluid shaving enhancement product, each of the pockets communicating with the chamber through a restricted opening to control flow of product into the pockets and hence release at the skin contacting surface.

The skin engaging member can be the guard of the blade unit or it can be another member, such as the cap.

A better understanding of the invention will be gained from the following detailed description of an embodiment, reference being made to the accompanying drawings, in which:

Figure 1 is a cut away perspective view of a razor blade unit according to the invention;

Figure 2 is a transverse cross section through the blade unit.

The safety razor blade unit shown in the drawings comprises a pair of blades 1, 2 mounted in tandem in a supporting frame, a guard 3 fastened to the frame and defining a hollow reservoir chamber 4, and cap 5 e.g. in the form of a strip of lubricating material carried by

- 5 -

the frame behind the blades.

The guard includes an upper wall 8 with an exposed surface 9 which is arranged to contact the skin during shaving. Within this wall is formed a multiplicity of pockets 10 positioned in a regular array extending over the length and width of the skin contacting surface. The pockets are disposed in a plurality of longitudinal rows, and in the shown example there are three rows with the pockets in adjacent rows longitudinally off set to permit the pockets to be closely spaced. The pockets are of circular configuration and in the illustrated embodiment all have the same diameter.

Each pocket 10 is in communication with the reservoir chamber 4 through a hole 12 shown to be of restricted area at the inner end of the pocket. The through flow area of the hole is selected to allow shaving enhancement product contained in the chamber 4 to flow at a controlled rate into the pockets where the product collects and remains held e.g. under the surface tension properties of the fluid product, ready to be discharged during shaving. The restricted hole also serves to obstruct the passage of the shaving aid product from the pocket back into the reservoir chamber, so that the pockets remain charged with product. In practice the reservoir chamber will contain sufficient volume of shaving aid product to last the full useful lifetime of the blade unit, that is until the blades have become dulled.

The shaving aid product preferably has lubricating property, but it may have, either alternatively or in addition, other, e.g. moisturizing properties considered beneficial

- 6 -

during shaving. It will have adequate fluidity to enable the product to pass from the reservoir chamber into the pockets, and adequate viscosity and surface tension characteristics to be held
5 in the pockets without flowing freely out from the pocket openings, and to be dispensed gradually during shaving, e.g. upon being made more fluid by contact with water, when the guard surface slides over the skin during shaving.

10 It is not an essential feature that the pockets should be supplied with shaving enhancement product and it is within the ambit of the present invention for the pockets to be shaped and dimensioned to collect a shaving
15 enhancement product applied to the skin during one time of shaving and to retain that product until the next time of shaving, e.g. to provide improved lubrication during the initial stages of the subsequent shave.

20 Modifications are of course possible without departing from the underlying inventive concept. For example, the member incorporating the pockets filled with shaving aid product could be made of a resilient material so that
25 the member will flex slightly during shaving to encourage product to flow from the pockets. In addition to the benefits mentioned above the apertured member with the pockets may have a beneficial tactile influence upon the skin.

- 7 -

C L A I M S

1. A safety razor blade unit comprising
at least one elongate blade, and a skin engaging
member extending longitudinally of the blade(s)
5 and defining a surface exposed for contact with
the skin during shaving said member including a
multiplicity of pockets for holding respective
portions of a shaving enhancement product, each
of said pockets opening at the skin contacting
10 surface, said pockets being distributed along
the surface and across the width thereof in an
array spanning substantially the whole of the
area of the skin contacting surface, and the
adjacent pockets being spaced at a distance of
15 5% to 100% of the maximum transverse dimension
of the pockets.

2. A safety razor blade unit comprising
at least one elongate blade, and a skin engaging
member extending longitudinally of the blade(s)
20 and defining a surface exposed for contact with
the skin during shaving, said member including a
multiplicity of pockets for holding respective
portions of a shaving enhancement product, each
of said pockets opening at the skin contacting
25 surface, said pockets being distributed along
the surface and across the width thereof in an
array spanning substantially the whole area of
the skin contacting surface, each pocket
containing a shaving enhancement product which
30 is retained in the pocket due to the properties
of the product and which is discharged gradually
therefrom during shaving.

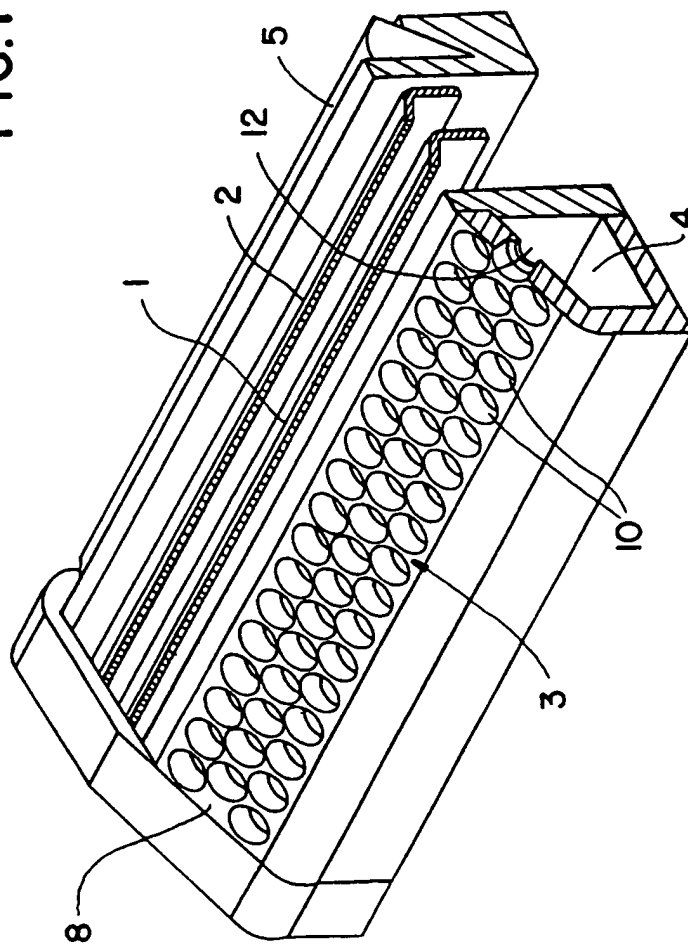
3. A safety razor blade unit comprising
at least one elongate blade, and a skin engaging
35 member extending longitudinally of the blade(s)
and defining a surface exposed for contact with
the skin during shaving said member including a

- 8 -

- multiplicity of pockets for holding respective portions of a shaving enhancement product, each of said pockets opening at the skin contacting surface, said pockets being distributed along the surface and across the width thereof in an array spanning substantially the whole area of the skin contacting surface, and the inner ends of at least some of the pockets communicating with a reservoir chamber containing shaving enhancement product to be dispersed via the pockets.
4. A safety razor blade unit according to claim 3, wherein each pocket communicates with the reservoir chamber.
5. A safety razor blade unit according to claim 3, wherein the pockets are formed in a wall member partially confining the reservoir chamber.
6. A safety razor blade unit according to claim 1, wherein the pockets have smoothly curved side walls.
7. A safety razor blade unit according to claim 6, wherein the pockets are cylindrical with the axes thereof substantially perpendicular to the skin contacting surface.
8. A safety razor blade unit according to claim 7, wherein the pockets are right circular cylindrical.
9. A safety razor blade unit according to claim 8, wherein the pockets have a depth not greater than the pocket diameter.
10. A safety razor blade unit according to claim 1, wherein the pockets are positioned in a plurality of longitudinal rows.
11. A safety razor blade unit according to claim 10, wherein the pockets of adjacent rows are longitudinally offset and overlap.

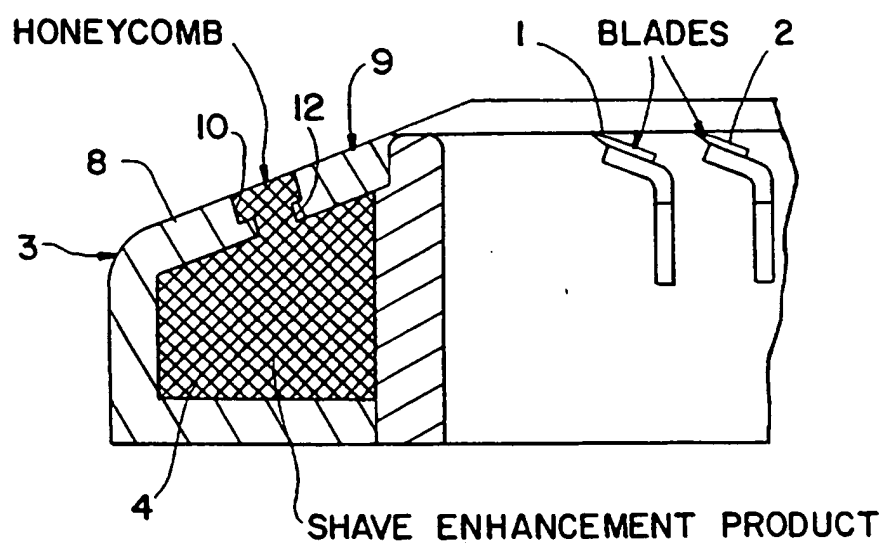
1 / 2

FIG. 1



2 / 2

FIG. 2



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US95/08634

A. CLASSIFICATION OF SUBJECT MATTER

IPC(5) :IPC(5): B26B 21/14

US CL :30/41,50,77

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 30/41,50,77,81,83

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
none

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
none

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US,A, 5,056,222 (Miller et al.) 15 October 1991, see Figs.4-6 and column 3, lines 9-43	1-2 ----- 3-5, 10
A	US,A, 5,092,042 (Miller et al.) 03 March 1992, see Figs.1 and 4-6 and column 2, lines 45-50.	1-11
A	US,A, 5,369,885 (Ferraro) 06 December 1994, see Fig.1.	1-11

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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